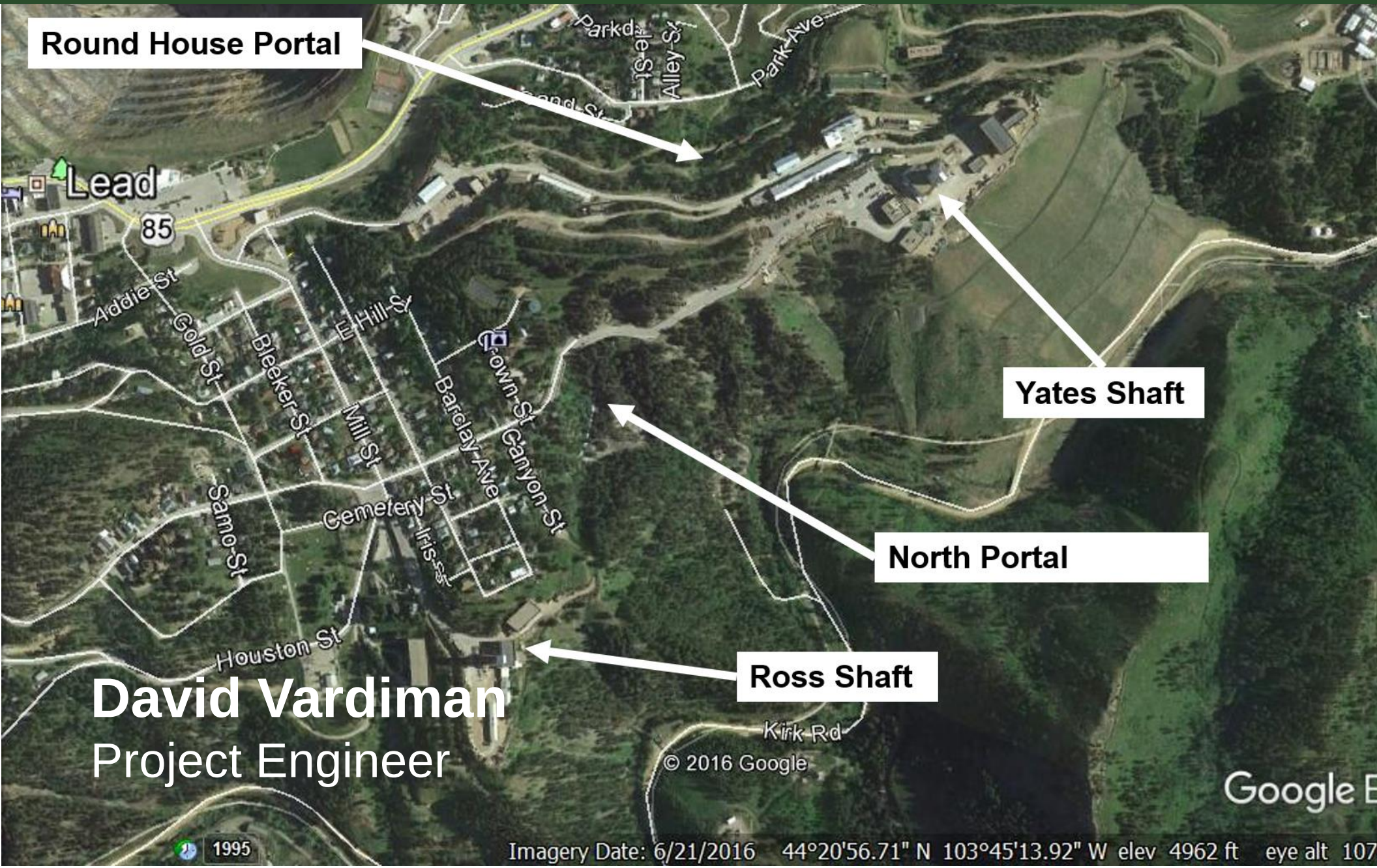
# Sanford Underground Research Facility Tramway Rehabilitation Project Site Visit




**David Vardiman**
Project Engineer

# Site Visit Agenda

| Time | Topic | Presenter |
|---|---|---|
| 9:00 – 9:05 | Introductions | |
| 9:05 – 9:15 | Introduction to LBNF/DUNE | David Vardiman |
| 9:15 – 9:30 | Procurement Guidelines | Sharon Hemmingson |
| 9:30 – 9:45 | EH&S Requirements | John Emick |
| 9:45 – 10:00 | Tramway Rehabilitation Project Scope | David Vardiman |
| 10:00 – 10:20 | Site Specific Safety Training, video, waivers | John Emick |
| 10:20 – 10:40 | PPE, tag in, van ride to Round House Portal | D. Vardiman, J. Emick |
| 10:40 – 11:00 | Discussion on Round House Portal SOW | David Vardiman |
| 11:00 – 11:10 | Walk to North Portal | " " |
| 11:10 – 11:30 | Discussion on North Portal SOW | " " |
| 11:30 – 11:40 | Walk to Round House Portal | " " |
| 11:40 – 12:00 | Communications Infrastructure SOW | " " |
| 12:00 – 12:15 | Van ride to Yates Admin. building | D. Vardiman, J. Emick |
| 12:15 – 12:30 | Close Out | David Vardiman |

# Introduction to LBNF/DUNE Project

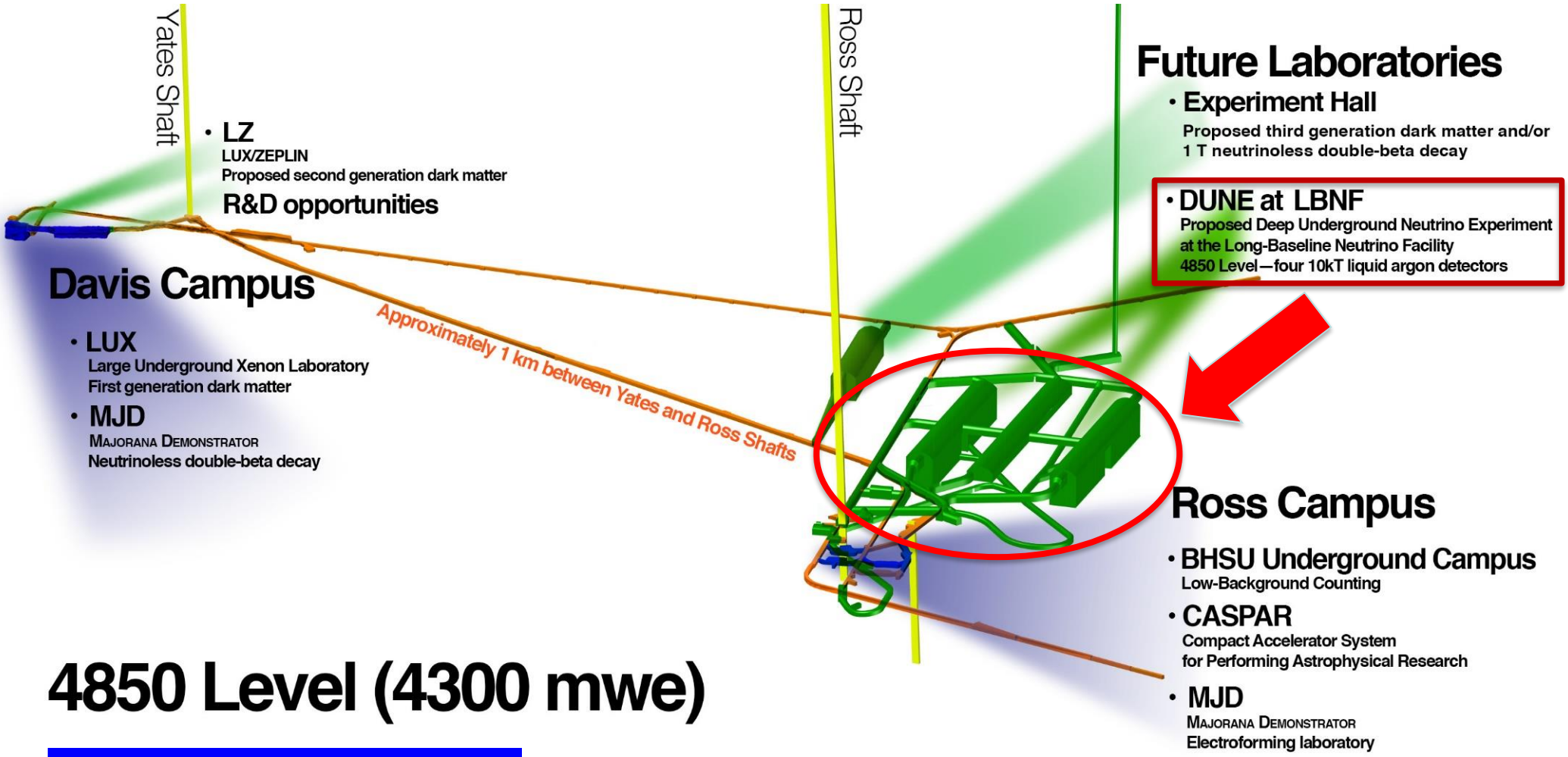
- The **D**eep **U**nderground **N**eutrino **E**xperiment will be a game-changing experiment for **neutrino science**, potentially transforming our understanding of why the universe exists as it does.
- The **L**ong-**B**aseline **N**eutrino **F**acility is the infrastructure necessary to send a powerful beam of neutrinos 800 miles through the earth, and measure them deep underground at South Dakota's Sanford Underground Research Facility.
- The DUNE/LBNF project will be the first internationally conceived, constructed, and operated mega-science project hosted by the Department of Energy in the United States.

**LBNF will drive neutrino science forward the way CERN's Large Hadron Collider drove Nobel Prize-winning Higgs discovery**

# LBNF/DUNE Project Overview

https://youtu.be/AYtKcZMJ_4c

# Underground Context




Existing facilities

Proposed facilities

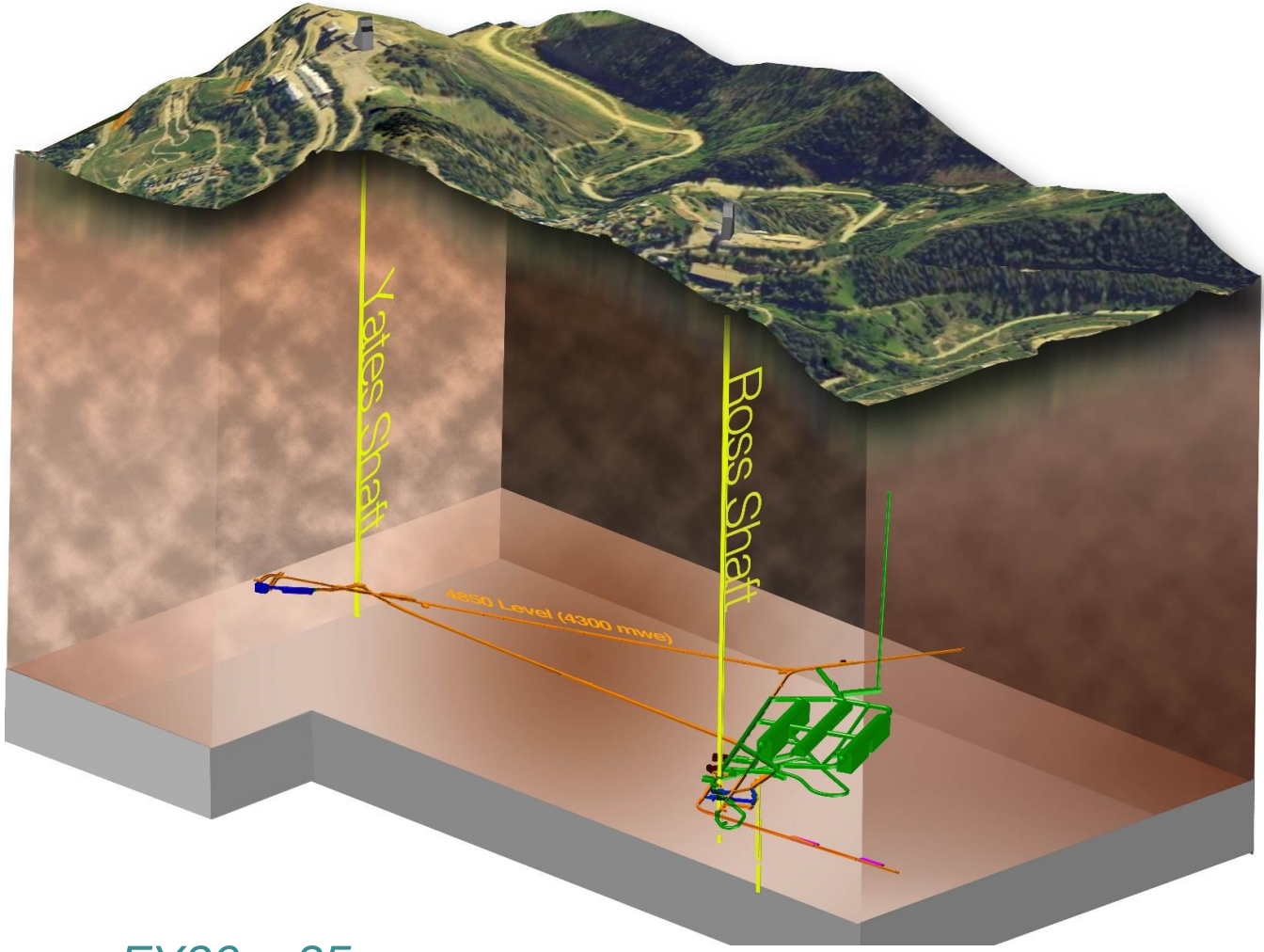
# Far Site Scope – Timeline

1. **Sanford Lab Reliability Projects**
   *FY16 – 18*
   - Ross shaft rehab
   - Hoist motor rebuilds, more…

2. **Pre-Excavation**
   *FY17 - 20*
   - Rock disposal systems
   - Tramway rehab
   - Headframe Reinforcement
   - Conveyor System

3. **Excavation/Construction**
   *FY18 – 22*

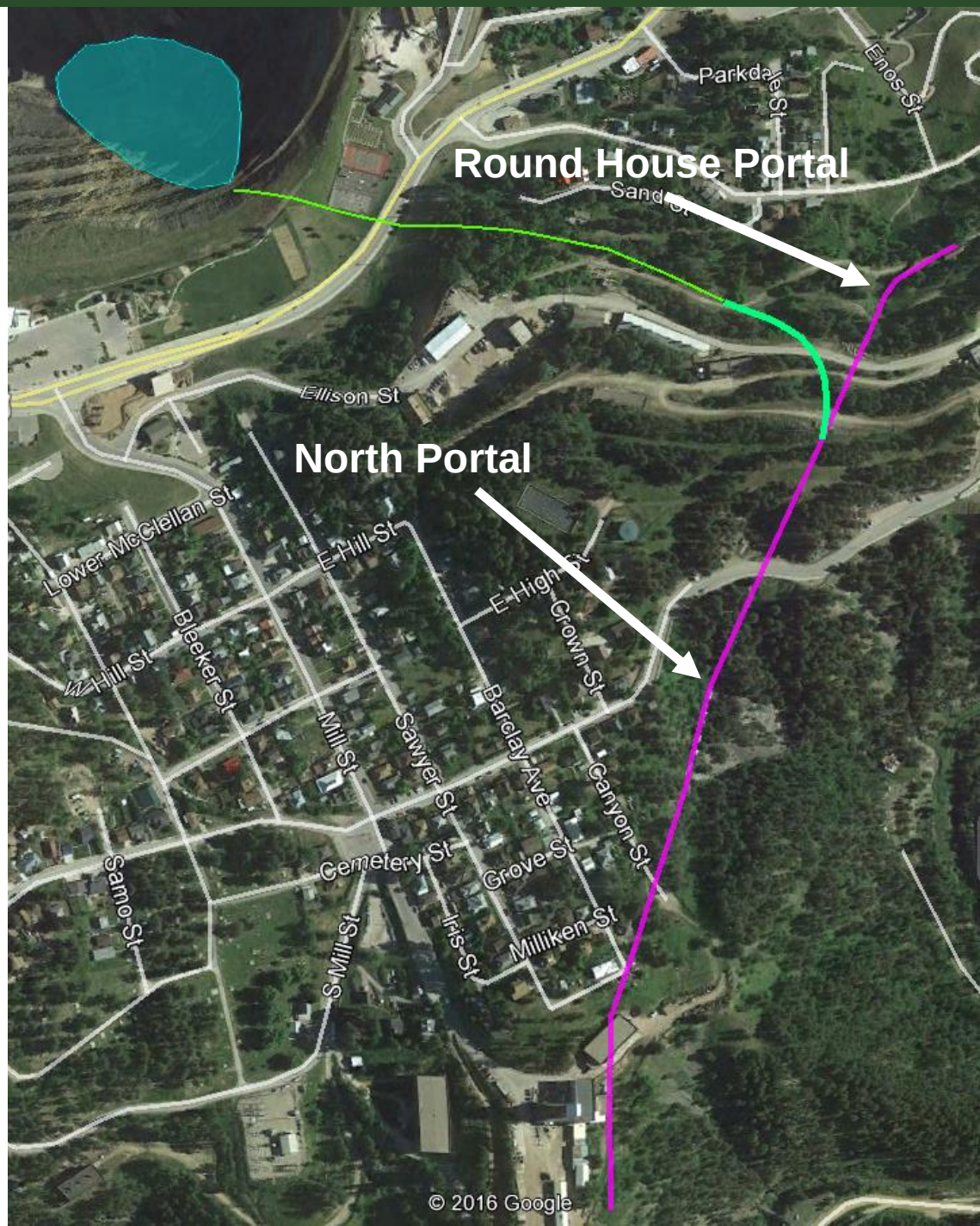
4. **Cryostats/Cryogenic Systems** *FY20 – 25*



# Surface Waste Rock Handling

By eliminating rail transport and a transfer station we've:

- Avoided having to control noise and dust at the transfer point
- Reduced overall energy consumption
- Eliminated one of the more visible parts of the system, which would have been directly above Gold Run Park.
- Minimized people working in the tramway tunnel, thereby reducing potential for safety incidents.



# Procurement

This slide presentation and today's Q&As will be posted online.

To ensure fair and equitable competition, SDSTA uses a formal written Question & Answer process. *No information will be available to any prospective offeror outside of this Q&A process.*

Please review all of the contract requirements, particularly:

- Insurance ($5M GL, $2M PL; auto, WC, EL. Addt'l insureds)
- Environmental Safety & Health
- Federal Requirements, including:
  - Registration in SAM.gov
  - E-verify
  - Davis-Bacon wage requirements
  - Buy American
  - Environmentally Preferable Products
- Release and Waivers (one per contract + one per person)
- Bond requirements
- Liquidated Damages – (Cost / $100,000) x $50 per day
- Submit resource-loaded schedule in Microsoft Project

# Procurement

- Price worksheet available on website

- Identify total cost per scope of work deliverable

- Identify unit cost (per linear foot) for 8 identified items

**Cost Worksheet - SDSTA/SURF TRAMWAY REHABILITATION PROJECT**

| **Round House Portal Scope of Work** | Total Cost | Cost per linear ft |
|---|---|---|
| Protection of existing infrastructure | | |
| Razing of snowshed and existing portal | | |
| Excavation to headwall and ground support | | |
| Construction of new portal and gate | | |
| Ballast | | |
| Closure of old snowshed | | |
| Reclamation | | |
| **Total** | $0 | |

| **North Portal Scope of Work** | Total Cost | Cost per linear ft |
|---|---|---|
| Protection of existing infrastructure | | |
| Razing of snowshed and existing portal | | |
| Excavation to headwall and ground support | | |
| Construction of new portal and gate | | |
| Ballast | | |
| Rebuild snowshed connection | | |
| Reclamation | | |
| **Total** | $0 | |

| **Communication Infrastructure Relocation** | Total Cost |
|---|---|
| Installation of new conduit connections to existing conduit | |
| Installation of new fiber optic and Femco lines | |
| **Total** | $0 |

| | |
|---|---|
| Mobilization/demobilization | |
| **Fixed Price** | **$0** |

# Contractor EH&S Requirements

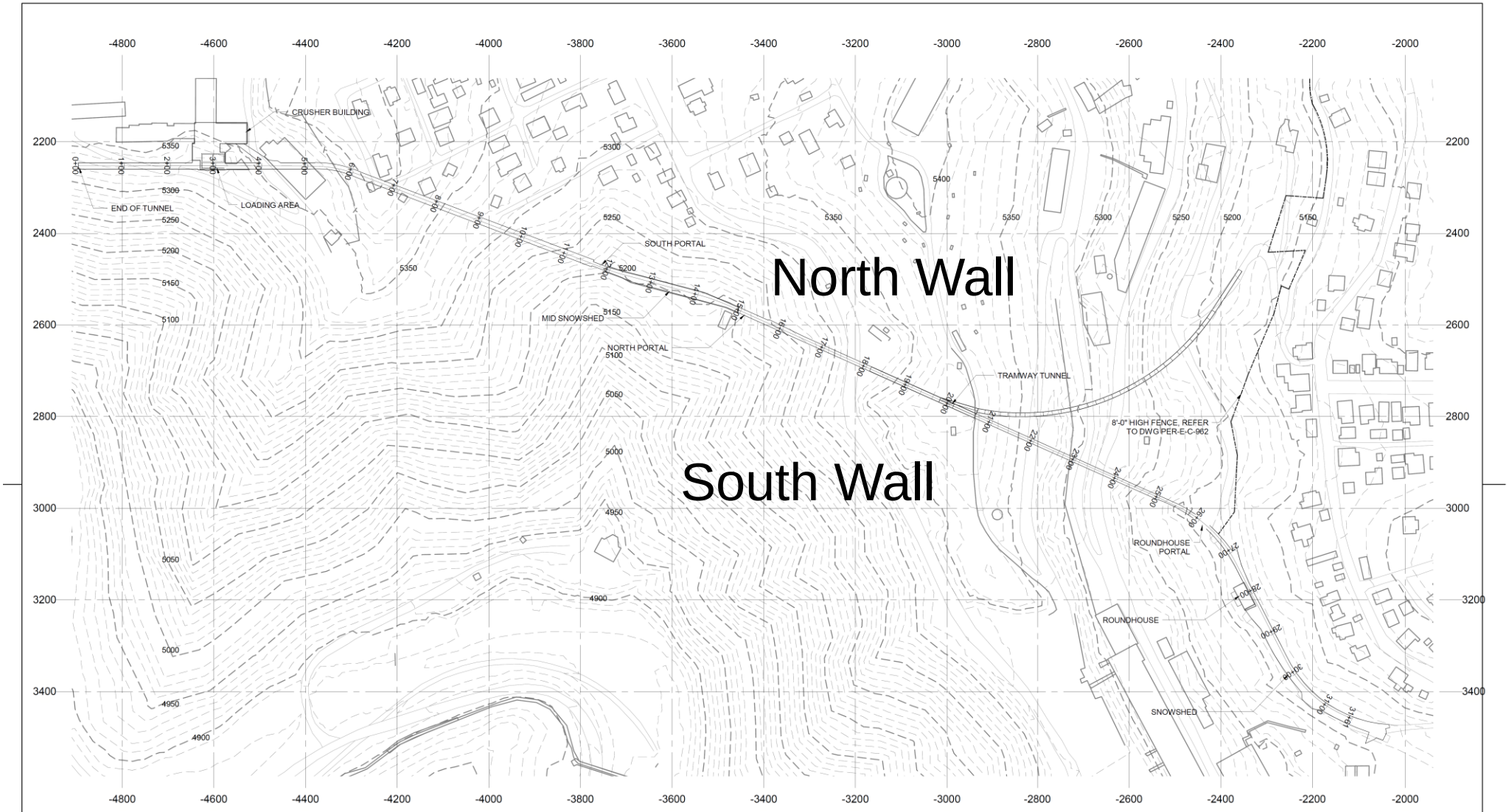
- Contractor is expected to obey all OSHA Construction Safety Regulations found in 29 CFR 1926 and Sanford Laboratory's Construction Safety Manual (see website)
- Contractor will have a dedicated ES&H representative on site ensuring all health, safety and environmental requirements of the work will be met (i.e. hot-work, hoisting and rigging, fall protection, confined space, injury reporting, site security, current and appropriate training)
- Contractor and employees will use a 5-point card
- Contractor will document all employee safety training records
- Daily toolbox talks will start each shift. Choose a topic that fits for the day and discuss issues that could become unsafe practices. The talks must be documented and available for inspection
- Job Hazard Analyses will be required for work that involves lifts, confined space, Contractor will be use Sanford Laboratory's JHA form found in the website
- Weekly meetings with the Project Managers to provide updates to schedules, coordination reviews, traffic, and pedestrian paths. Meet in the Administration building, day/times TBD
- Contractor will ensure all workers receive Sanford Laboratory's site specific training
- The contractor will provide a quality assurance plan. Contractor will have a site security plan and means to restrict access and control site entry without permission

# Tramway Rehabilitation Project Work Schedule

The expected schedule, subject to change, is as follows:

| | |
|---|---|
| Proposals due to SDSTA | April 3, 2017 |
| Successful Offeror Selected | May 1, 2017 |
| Owner/Contractor/Designer Value Engineering | May 8, 2017 |
| Updated Proposals following VE | May 12, 2017 |
| Contract Issued | May 15, 2017 |
| NTP Issued | Aug 1, 2017 |
| *CM/GC Mobilizes* | *Jan 31, 2018* |
| Contract Ends | May 15, 2018 |

# Tramway Rehabilitation Project Overview




| REV. | DATE | DESCRIPTION |
|---|---|---|
| 5 | 02/15/17 | PRE-EXCAVATION 100% FINAL DESIGN SUBMISSION |
| 4 | 12/23/16 | PRE-EXCAVATION 100% FINAL DESIGN SUBMISSION |
| 3 | 10/13/16 | PRE-EXCAVATION 90% FINAL DESIGN SUBMISSION |
| 2 | 07/14/16 | PRE-EXCAVATION 60% FINAL DESIGN SUBMISSION |
| 1 | 03/22/16 | PRE-EXCAVATION 30% FINAL DESIGN SUBMISSION |

REVISIONS

McMILLEN JACOBS ASSOCIATES · srk consulting · MINCORE

PROJECT NORTH

SCALE: 1"=100'-0" (100' 0 100' 200' SCALE FEET)

Fermilab
Long-Baseline Neutrino Facility

| | | |
|---|---|---|
| DESIGNED | AG | ARUP |
| DRAWN | NK | ARUP |
| CHECKED | JH | ARUP |

**LBNF-FSCF-EXCAVATION**
**PRE EXCAVATION PACKAGE**
**TRAMWAY TUNNEL REHABILITATION**
**TRAMWAY TUNNEL PLAN**

DRAWING NO. 15-1-6 PER-E-C-963 REV. 5

02/15/17

3/1/2017 4:25:05 PM

# Contract Technical Scope

**Round House Portal**

- Protection of existing infrastructure
- Razing of snowshed and existing portal
- Excavation to headwall and ground support
- Construction of new portal and gate
- Ballast
- Closure of old snowshed
- Reclamation

**North Portal**

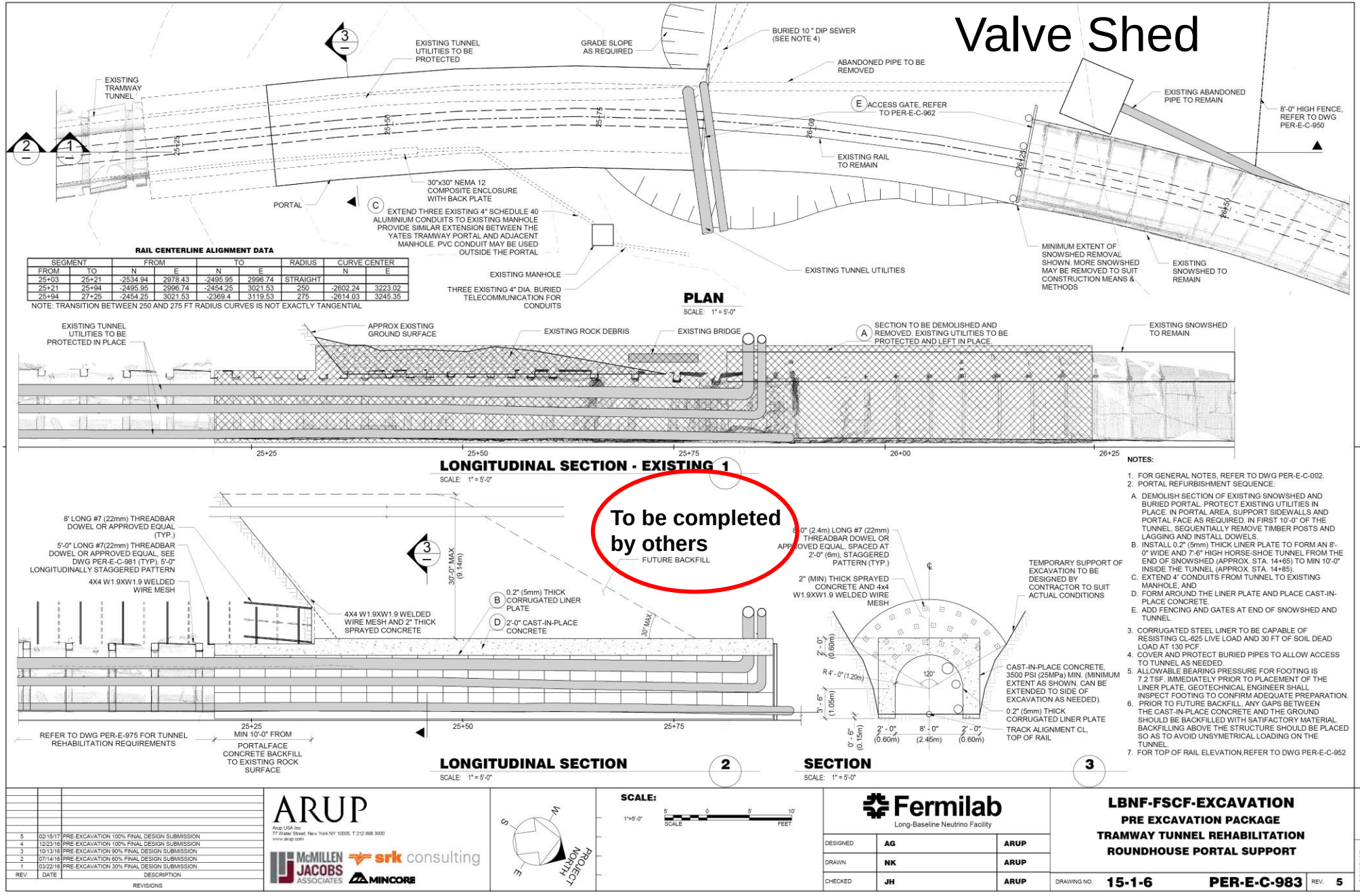
- Protection of existing infrastructure
- Razing of snowshed and existing portal
- Excavation to headwall and ground support
- Construction of new portal and gate
- Ballast
- Rebuild snowshed connection
- Reclamation

**Communications Infrastructure Relocation**

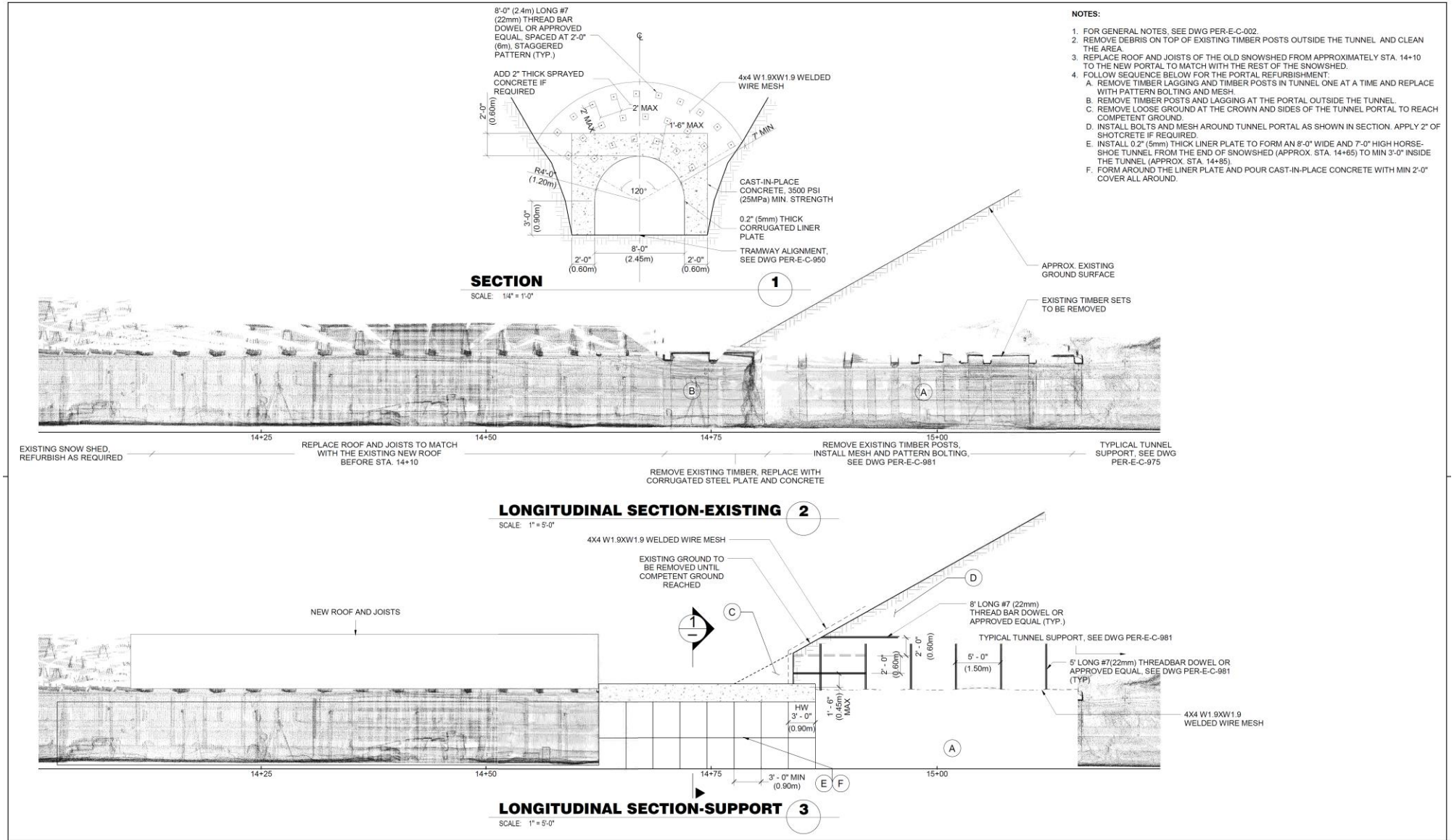
- Installation of new conduit connections to existing conduit
- Installation of new fiber optic and Femco lines

# Round House Portal

# Round House Portal



# North Portal

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ARUP
Arup USA Inc
77 Water Street, New York NY 10005, T 212 896 3000
www.arup.com

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SCALE:

AS NOTED

Fermilab
Long-Baseline Neutrino Facility

| | | |
|---|---|---|
| DESIGNED | AG | ARUP |
| DRAWN | NK | ARUP |
| CHECKED | JH | ARUP |

**LBNF-FSCF-EXCAVATION**
**PRE EXCAVATION PACKAGE**
**TRAMWAY TUNNEL REHABILITATION**
**NORTH PORTAL SUPPORT**

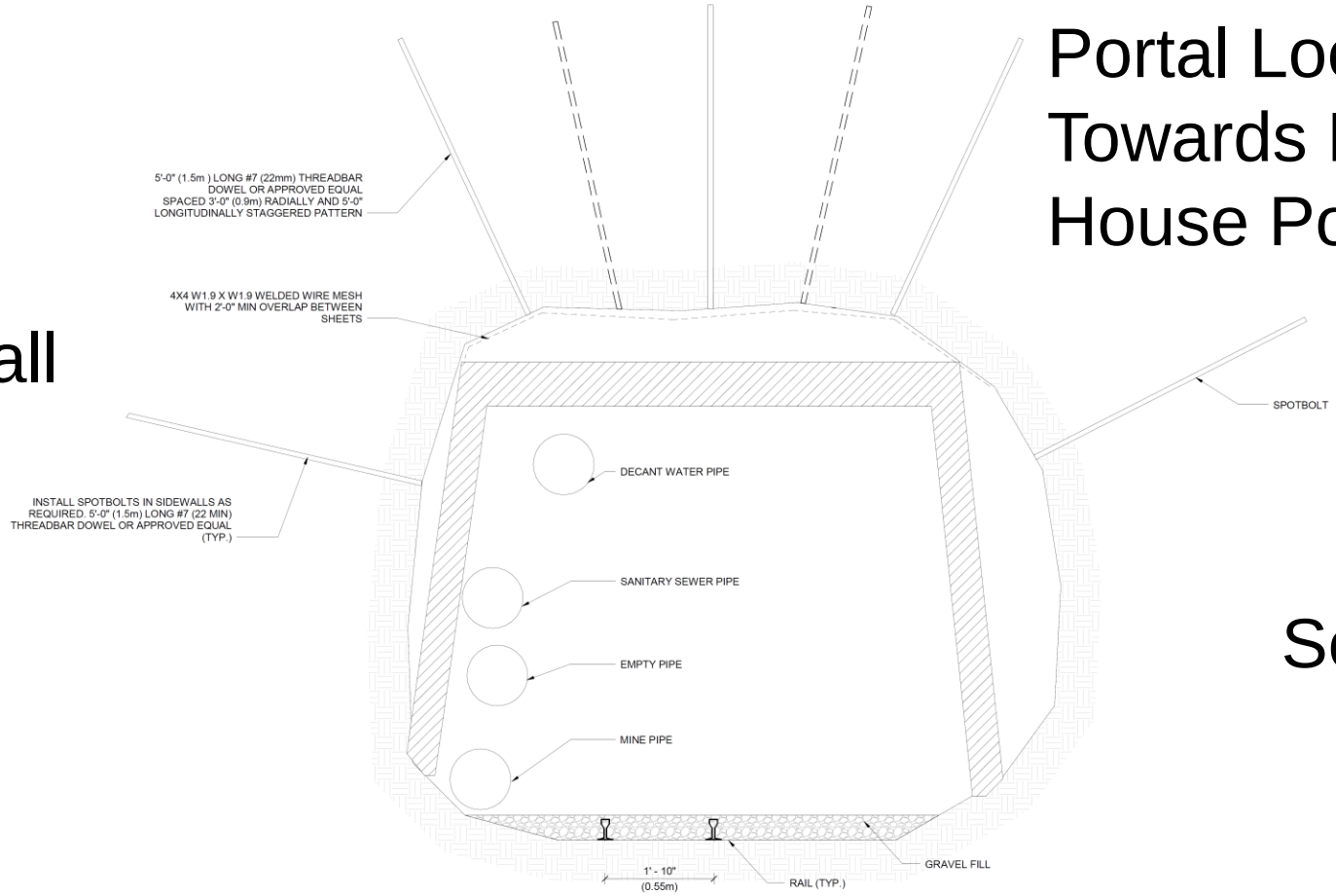
DRAWING NO. 15-1-6 PER-E-C-982 REV. 4

# Portal Ground Support

Section at North Portal Looking East Towards Round House Portal

North Wall

South Wall




**TYPICAL CROSS SECTION AT TRAMWAY SUPPORT** 1

SCALE: 1" = 1'-0"

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SCALE: 1"=1'-0" 1' 0 1' 2' SCALE FEET

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Long-Baseline Neutrino Facility

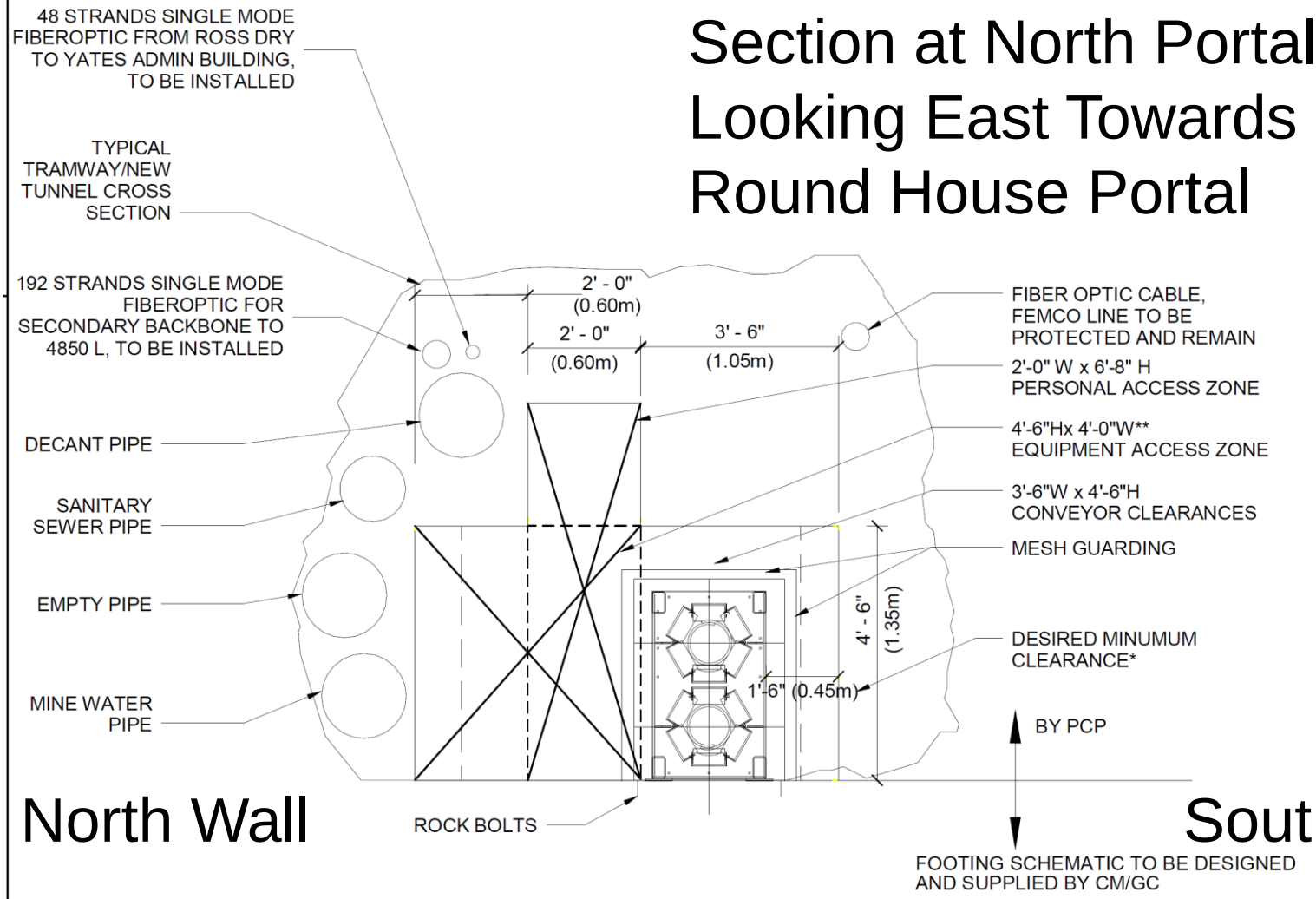
| | | |
|---|---|---|
| DESIGNED | AG | ARUP |
| DRAWN | NK | ARUP |
| CHECKED | JH | ARUP |

**LBNF-FSCF-EXCAVATION**
**PRE EXCAVATION PACKAGE**
**TRAMWAY TUNNEL REHABILITATION**
**TRAMWAY SUPPORT**

DRAWING NO. 15-1-6 PER-E-C-981 REV. 3

# Portal Gates Design & Fabrication

## Section at North Portal Looking East Towards Round House Portal




North Wall

South Wall

* ABSOLUTE MINIMUM CLEARANCE 0'-9" AT LOCATIONS WITH REDUCED WIDTH SHOWN ON DWGS PER-E-C-964 TO PER-E-C-969
**ABSOLUTE MINIMUM CLEARANCE 3'-3" AT LOCATIONS WITH REDUCED WIDTH SHOWN ON DWGS PER-E-C-964 TO PER-E-C-969

**SECTION ON TRAMWAY CLEARANCE** 3

SCALE: 1/2" = 1'-0"

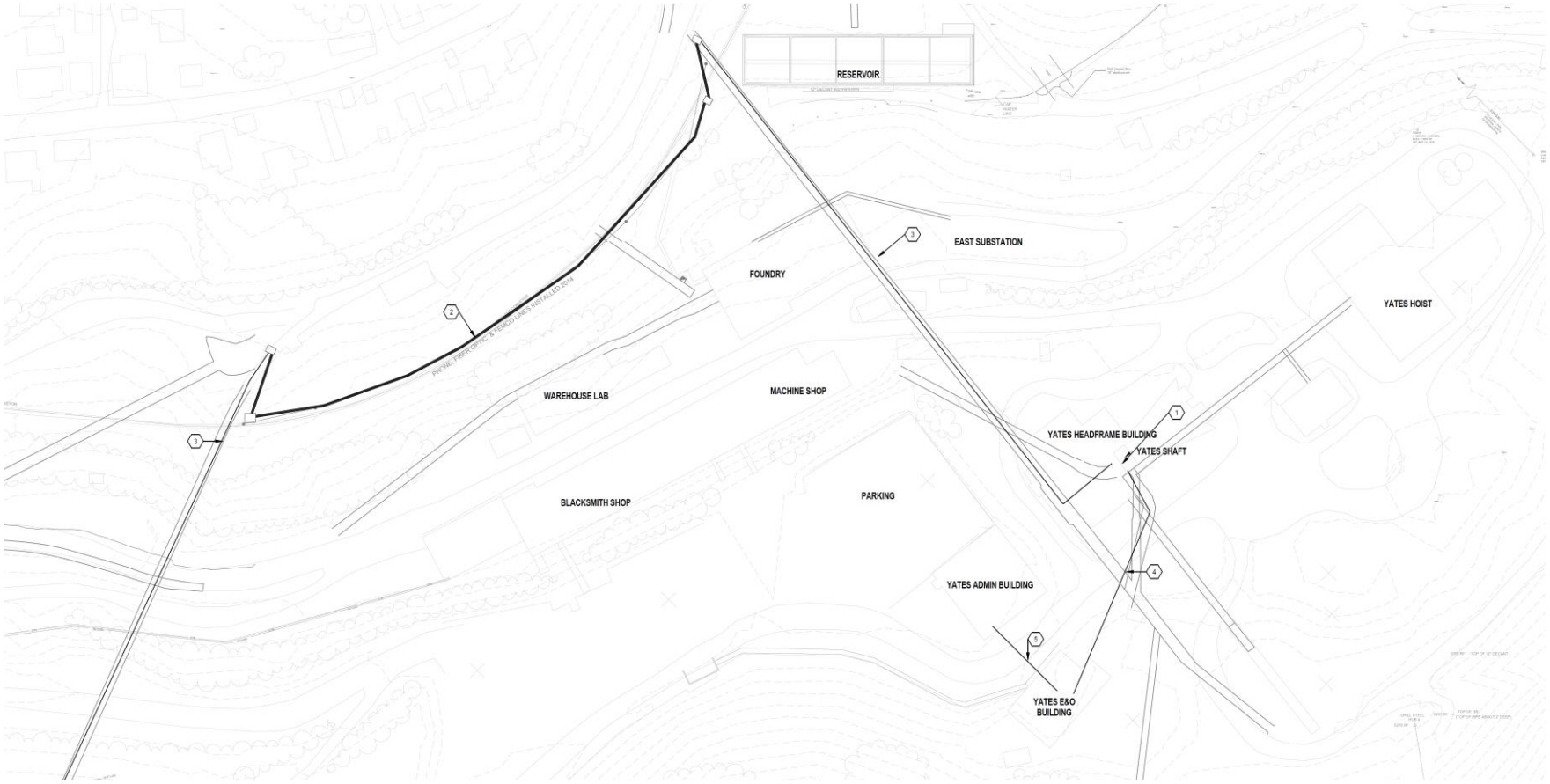
# Communication Infrastructure Relocation

**GENERAL NOTES:** SITE PLAN

A. SEE PER-B-T-301 FOR RACEWAY SINGLE LINE DIAGRAM.
B. SEE PER-E-T-302 FOR CABLE/STRAND COUNT DETAILS.
C. PROVIDE PULL BOXES AS NEEDED FOR ALL RACEWAYS.

**KEY NOTES:** SITE PLAN

1. CABLE TRANSITION FROM YATES TRAMWAY INTO YATES SHAFT. CABLES TO BE ROUTED EXPOSED WITH CONTINUOUS SUPPORT DOWN SHAFT.
2. THREE EXISTING 4" CONDUITS TO BE USED FOR ROUTING OF NEW FIBER.
3. APPROXIMATE ROUTE OF FIBER RUNS WITHIN ROSS TRAMWAY AND YATES TRAMWAY.
4. ONE NEW 4" CONDUIT TO BE INSTALLED IN EXISTING UNDERGROUND WALK-THROUGH TUNNEL FROM HEADFRAME TO EDUCATION AND OUTREACH BUILDING.
5. APPROXIMATE FIBER ROUTE IN EXISTING UTILITY CHASE FROM EDUCATION AND OUTREACH BUILDING TO YATES ADMIN BUILDING.

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srk consulting | TSP | POWER ENGINEERS

PROJECT NORTH
W E S

SCALE:
1"=60'-0"
60 0 60 120
SCALE FEET

Fermilab
Long-Baseline Neutrino Facility

| | | |
|---|---|---|
| DESIGNED | DLB | TSP |
| DRAWN | KAO | TSP |
| CHECKED | DLB | TSP |

**LBNF - FSCF - BSI**
**PRE-EXCAVATION PACKAGE**
**CYBERINFRASTRUCTURE**
**ENLARGED SITE PLAN - YATES COMPLEX**

DRAWING NO. 15-1-6 PER-B-T-103 REV. 5

# Q&A

Questions?